



NATIONAL PETROCHEMICAL COMPANY
STANDARDS

MATERIAL STANDARD
FOR
ELECTRICAL PANEL BOARDS

NPCS-MS-EL-13

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1 SCOPE

- 1.1 This standard covers the minimum requirements for the design, fabrication, supply and testing of panel boards.
- 1.2 Site conditions and system conditions shall be as what will be specified in the material requisition. The panel boards shall comply with the requirements of the following documents listed in order of precedence:
- a) Purchase order.
 - b) This standard.
 - c) Other specifications and standards referred to.
 - d) Vendor drawings.
- 1.3 All documents shall be issued using SI metric system of measurement, according to NPCS-ES-GN-03.
- 1.4 The English language shall be used for all correspondence documents, catalogues and drawings. All other languages are not acceptable.
- 1.5 In the reference number of this standard, purchaser means National Petrochemical Company of Iran "NPC".

2 STANDARDS AND CODES

The panel boards shall be constructed, wired and tested in accordance with all applicable sections of the latest below listed Standards and codes.

2.1 FOR EQUIPMENT MANUFACTURED IN EUROPE

- IEC International Electrotechnical Commission.
- IEC 144 Degrees of Protection of Enclosures for Low Voltage Switchgear and Control Gear.



IEC 439

Low Voltage Switchgear and
Control Gear Assemblies.

IEC 529

Classification of Degree of
Protection Provided by
Enclosures.

2.2

FOR EQUIPMENT MANUFACTURED IN THE USA

- NEMA

National Electrical
Manufacturer's Association.

- NEC

National Electrical Code.

2.3

For equipment manufactured outside of Europe and
USA, either of the standards and codes listed in
clause 2.1 or 2.2 above, shall be met.

2.4

The panel boards may conform with the national
standards of the country of manufacturer, provided
these standards are based on IEC recommendations.
Vendor shall state in the quotation the standard to
which the panel board conforms. If these are the
national standards, then vendor shall state in the
quotation the deviation, if any, from the relevant
IEC recommendations.

3

TECHNICAL REQUIREMENTS

3.1

The panel boards and individual equipment and
components shall be suitable for the expected short
time currents. The values of the short circuit and
earth fault currents and duration, shall be as what
will be indicated on the one line diagram. If not
otherwise indicated, the duration times of the
currents mentioned above shall not be less than 1 S.

3.2

When no information is given regarding earth fault
currents, the value shall be assumed as being equal
to the phase to phase fault current. The circuits
downstream of the circuit breakers shall be suitable
for the relevant tripping characteristics (current/
time).

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- 3.3 The panel boards and the individual components shall be sized assuming that:
- a) All the equipment, including the spare equipment, is rated as indicated on the one line diagram.
 - b) The bus bars are at their rated current.
 - c) The site conditions are taken into account with the ambient temperature at its maximum value.
- 3.4 The panel boards shall be able to withstand the mechanical, electrical and thermal stresses and the corrosive phenomena.
- 3.5 The panels and the covers forming the enclosure shall be fastened with screws.
The opening of doors and the removal of covers mechanically fastened, shall only be possible by means of groove keys or tools.
The types of keys and tools mentioned above shall be reduced to a minimum consistent with the safety requirements.
- 3.6 Panel boards shall be operated from the front.
- 3.7 Panel boards shall have minimum protection class as per IEC 144 as follows:
- a) Indoor industrial buildings IP 44.
 - b) Indoor electrical rooms, control room: IP 41.
 - c) Indoor office buildings IP 20.
- Ventilation or drainage openings, if any, shall be at least IP 3X.
- 3.8 It shall be possible for specialized and authorized personnel to carry out the following operations, with the switchboard alive:
- a) Visual inspection of equipment.
 - b) Operation of disconnecting switches.
 - c) Replacement of circuit breakers, etc.
 - d) Connection of incoming cables.
- To permit these operations, barriers shall be provided between adjacent circuits that might accidentally be touched.